

Tanganyika, and, as he passed up Lake Nyassa, began his investigations in that lake, in order to be able to compare its products with those of Tanganyika. On Lake Nyassa Mr. Cunningham was able to get a good number of tow-nettings from different parts of the lake's surface, and obtained, on the whole, a large quantity of its characteristic phytoplankton, besides a considerable amount of zooplankton, consisting mostly of Copepoda, Cladocera, and insect-larvæ. The temperature of the water of Lake Nyassa was observed to fall seldom below 70°, while the temperature at 76 fathoms below the surface was ascertained to be about three degrees higher.

Mr. Cunningham arrived at Karonga, at the head of Lake Nyassa, at the end of June, 1904, and travelled on to Tanganyika by the ordinary route of the Stevenson road. His last letters from Tanganyika are dated at Vua, on October 29, 1904. He had obtained a dhow from Ujiji, which enabled him to make his stay at different places on the lake longer or shorter according as he found much or little to collect. A good series of fishes had been preserved, and many freshwater crustaceans. As regards the vegetable life, Mr. Cunningham had been much struck by the near resemblance of all the forms obtained in Tanganyika to those which he had collected in Nyassa, though he could not, of course, say that they were specifically identical. From Vua, Mr. Cunningham had arranged to cross to the east coast of the lake, and to go some distance further north before returning to the western shore. Mr. Cunningham may be expected to return to England before the end of the year.

NOTES.

SIR JAMES DEWAR has presented the proceeds of the Gunning prize, amounting to one hundred guineas, recently awarded to him by the Royal Society of Edinburgh, as a contribution to the fund for the encouragement of research, now being founded in the University of Edinburgh in memory of the late Prof. Tait.

WE regret to learn from the London branch of the Zeiss optical firm that Prof. Abbe, of Jena, died a few days ago. We also announce with regret the death of M. Paul Henry, astronomer at the Paris Observatory. His brother, M. Prosper Henry, with whom he was associated for many years in celestial photography, died about eighteen months ago.

THE Paris Société d'Encouragement pour l'Industrie nationale has awarded the grand prize of the Marquis d'Argenteuil to MM. Auguste and Louis Lumière for their photographic discoveries. M. Héroult has been awarded a grand gold medal for his works on electro-metallurgy.

THE two Antarctic ships *Terra Nova* and *Morning* were sold at Portsmouth on January 11. Messrs. W. Ziegler and Co., New York, bought the *Terra Nova* for 9600*l.*, and she will probably be used for North Polar exploration. The *Morning* was sold for 1600*l.* The *Discovery* has been sold privately to the Hudson's Bay Company for 10,000*l.*

M. L. BONNAMÈRE has been elected president for 1905 of the Prehistoric Society of France.

THE death is announced of Dr. Anton Müttrich, professor of physics and mathematics in the Academy of Forestry at Eberswald.

SIR WILLIAM THISELTON-DYER, K.C.M.G., will take the chair at a lecture to be delivered at the West India

Committee Rooms, Seething Lane, on Wednesday, January 25, by Mr. W. G. Freeman, superintendent of the colonial economic collections at the Imperial Institute, on "The West Indian Fruit Industry."

THE next competition for the Howard medal of the Royal Statistical Society will take place in the ensuing session. The essays must be sent in on or before June 30. In addition to the medal, a grant of 20*l.* will be awarded to the successful competitor. The subject is:—"A Critical Inquiry into the Comparative Prevalence of Lunacy and other Mental Defects in the United Kingdom during the Last Fifty Years."

THE death is announced of Mr. T. W. Shore, author of a number of papers on geological and archæological subjects. Mr. Shore was for a long time resident at Southampton, where he acted as curator of the Hartley Institution and secretary of the Hampshire Field Club. At the Southampton meeting of the British Association in 1882 he was one of the secretaries of the section of geology. On removing to London, he founded the Balham Antiquarian Society, and became its secretary; he was also secretary of the London and Middlesex Archæological Society.

WE have received a letter from Mr. C. E. Stromeier, of Manchester, in which he suggests that irregularities of the earth's surface might be detected by special observations for determining the position of the northern and southern limits of totality during the coming total solar eclipse of August next. Unfortunately there are many practical difficulties in the way which the author has not discussed, but he makes one suggestion which might be carried out. He proposes to place soldiers at short distances along the northern and southern borders of the shadow's path, who, by marking the positions where the eclipse was total, might determine with greater accuracy than is known the breadth of the moon's shadow.

A CORRESPONDENT writes:—The death of Dr. Thomas Woods occurred on January 5 in Birr (or Parsonstown). Dr. Woods was born in February, 1815, and graduated as doctor of medicine in Glasgow in 1838. He spent all his long life as a medical practitioner and as medical officer of the union and dispensary in Birr. So it is, perhaps, not to be wondered at that his scientific work belonged largely to a former generation. He was a chemist, and as such took part in the early development of photography, originating in the 'forties a new wet plate process, the "catalysotype," a detailed description of which may be found in Hunt's "History of Photography." In 1852 and 1853 he published in the *Philosophical Magazine* some original observations on the heat developed by chemical combination, and defended with considerable success his claim of priority against Andrews and Joule. He was a man of remarkable ability and astoundingly general scientific interest, and it is much to be regretted that circumstances kept him in a small country town, and that his professional duties prevented him from adding further to scientific knowledge. He continued mentally and bodily fresh to the very end, ever eager to hear of the latest scientific discoveries, and Birr feels distinctly the poorer for his loss.

A REUTER message from Christiania states that at Nesdal, north of Bergen, on Sunday, a mass of rock slipped into the Loenvand Lake. A wave of water twenty feet high, which resulted from the fall, swept the neighbourhood, carrying away houses, people, and cattle.

As supplementary to the paragraph on the recent fall of cliff at St. Margaret's Bay, near Dover (NATURE, January 12), it may be mentioned that the cliffs at St. Margaret's Bay, which rise from 150 to 300 feet, are formed of the Upper Chalk, comprising soft chalk and harder nodular bands, with scattered flints and occasional continuous seams of flint. These beds are surmounted by chalk, with many layers of flint nodules and some continuous bands of flint; and this portion of the chalk forms the mass of the cliffs at St. Margaret's Bay, the lower beds appearing at beach level and rising southwards. The general dip of the chalk is to the north-east, corresponding to some extent with the trend of the coast from East Wear Bay to Dover and St. Margaret's. Numerous falls of cliff have taken place along this coast for many centuries, the greatest losses having occurred above East Wear Bay in the great landslide of the Warren, where notable founders occurred in 1716 and again in 1886. Such slips along the sea-front may serve for a time to protect the cliffs from further waste, until the débris is removed by the breakers. Copious springs issue along the foot of the cliffs here and there, and a powerful spring issues at St. Margaret's Bay. These probably had no direct influence on the recent falls of cliff, but rather would the slips be due to the local feeders of the springs, to their erosive action along joints in the chalk, and to the effects of frost. It is quite possible, as has been suggested, that blasting operations at the Admiralty Harbour at Dover may have accelerated the falls of cliffs at points where they were weakened by natural agencies.

THE *Victorian Naturalist* brings us news of the death, on November 18, 1904, of Mr. J. G. Luehmann, Government botanist and curator of the National Herbarium at Melbourne, at the age of sixty-one. Mr. Luehmann went to Victoria in 1862, and in 1867, on the resignation of Mr. E. B. Heyne, secretary to the late Baron von Mueller, Mr. Luehmann was offered the position, which he accepted, and he remained connected with the botanical department until shortly before his death. For many years he made the preliminary identifications of specimens for Baron von Mueller, becoming an authority on the eucalypts and acacias. His great assistance was acknowledged by Baron von Mueller in the preface to the "Key to the System of Victorian Plants." In the early days of the Field Naturalists' Club of Victoria, before the institution of the *Victorian Naturalist*, he contributed papers on the eucalypts and acacias. In 1896, on the death of Baron von Mueller, he was appointed curator of the National Herbarium, and afterwards became Government botanist. During late years he contributed several descriptions of plants to the club's proceedings, in addition to an interesting paper—observations on pre-Linnean botanists—in which he directed attention to the many valuable botanical works in the herbarium library. He was one of the earliest Victorian fellows of the Linnean Society of London.

In a paper in the *Lancet* (January 7) Mr. G. C. Chatterjee, working under the direction of Captain L. Rogers, I.M.S., announces that he has succeeded in cultivating trypanosomes from the Leishman-Donovan body or parasite, thus confirming Captain Rogers's previous work in this direction.

WE have received the first number of the new volume of the *Journal of Hygiene* (vol. v., No. 1), which continues to maintain its previous high standard. It contains papers on piroplasmiasis by Mr. Bowhill and by Mr. Ross, cultivation of trypanosomata by Mr. Smedley, epidemi-

ology of plague by Mr. Hankin, a leprosy-like disease in the rat by Mr. Dean, &c. An introductory memoir, with a portrait, gives an account of the work of the late Sir John Simon.

MM. SALOMONSEN AND DREYER have conducted some experiments on the effect of the radium emanations on certain Protozoa and on the blood. The material consisted of fifty milligrams of pure radium bromide covered with a sheet of mica. On *Nassula* the radium had little effect, even with an exposure of six days. Some amœbæ were killed in less than twelve hours, but others survived four days. *Trypanosoma Brucei* was killed in from two to three hours. On blood corpuscles the radium exerted a hæmolytic power.

H.R.H. PRINCESS CHRISTIAN and Mr. Chamberlain were present on Friday last at St. George's Hall, Liverpool, on the occasion of a meeting in connection with the Liverpool School of Tropical Medicine, at which a lecture was delivered by Major Ronald Ross, F.R.S., on "The Progress of Tropical Medicine." Major Ross, in the course of his address, alluded to the discoveries which had proved that yellow fever is conveyed solely by mosquitoes, to the work of Sir William MacGregor in the suppression of malaria in Lagos, and to the anti-malarial measures of the Suez Canal Company, which had resulted in a reduction of the annual rate of malarial fevers at Ismailia from two thousand to two hundred. He also alluded to the fact that the Liverpool School had sent out no less than fourteen expeditions to investigate tropical diseases in various parts of the world.

Nature for December, 1904, contains some realistic, and perhaps rather ghastly, photographs of a python and its prey, taken from menagerie specimens. In the first of the series we have an unfortunate rabbit "fascinated" and about to be seized by a python, in the second the rodent in the coils of the serpent, and in the third the python commencing to devour the crushed carcass.

THE most important, or at all events the longest and most fully illustrated, paper in the second part of vol. ii. of the quarterly issue of *Smithsonian Miscellaneous Contributions* is one by Mr. C. Schuchert on Silurian and Devonian cystoid echinoderms and the genus *Camara-crinus*, in the course of which many new forms are described, and some valuable contributions made to the morphology of the group. Among the other contents of this issue, reference may be made to a list of west Indian birds by Mr. J. H. Riley.

THE issue of *Biologisches Centralblatt* for January 1 contains an article by Dr. E. Rádl on the hearing of insects, at the conclusion of which it is pointed out that this sense is much less developed in that group than in the higher vertebrates. The hearing of insects seems, in fact, to be a muscular rather than a nervous sense. The other articles include one by Mr. H. S. Skorikow on the plankton of the Neva, in the course of which several new forms are described, and one by Dr. O. Zacharias on the light-organs of *Ceratum tripos*.

ICHTHYOSAURS, or the extinct marine "fish-lizards" of the Mesozoic epoch, form the subject of an article by Prof. H. F. Osborn in the January number of the *Century Magazine*. After tracing the ichthyosaurian paddle into a limb of the type of that of the existing terrestrial tuatera lizard (*Sphenodon*) of New Zealand, which is regarded as nearly related to the ancestral stock of the group, the

author proceeds to point out how much we know with regard to the nature of the soft-parts and the life-history of the fish-lizards. We are aware, for instance, that they had a dorsal and a caudal fin, a naked scaleless skin, and a spiral valve to the intestine, similar to that of sharks; while, from the inclusion of skeletons of fetuses within the ribs of full-grown individuals, we also know that they produced living young. This viviparous condition is, of course, an adaptive modification, similar to that which occurs in the sea-snakes of to-day, rendered necessary by the pelagic habits of these reptiles. The similarity in bodily form existing between sharks, dolphins, and fish-lizards is referred to as another instance of such an adaptive modification. Excellent illustrations—one showing a female ichthyosaur and her progeny—accompany the paper. Apparently the author is unaware that the name *Shastasaurus*, proposed for a Triassic American ichthyosaur, has been changed, on account of pre-occupation, to *Merriamia*.

A PAPER upon Mendel's discoveries in heredity, read by Mr. C. C. Hurst before the Leicester Literary and Philosophical Society, gives a succinct account of Mendel's experiments, and the rules which he evolved therefrom; also it contains a list of the chief experiments with different plants and animals which have been carried out subsequently. The paper is published in the *Transactions* of the society, vol. viii. (June, 1904), and in the same part will be found a useful summary prepared by Mr. H. St. J. Donisthorpe of additions to British Coleoptera during the last ten years.

IN the *Comptes rendus*, vol. xxxv., No. 6, of the Imperial Society of Naturalists of St. Petersburg, lists of new plants for the Crimea are given by Mr. K. Golde and Mr. A. Younghé. Two of the most striking mentioned by Mr. Younghé are *Crambe juncea*, a Persian plant, which grows to the height of a man, and *Lythrum nanum*, a dwarf Siberian plant. Both botanists make a special reference to the freshwater plants, which include species so familiar to us as *Zannichellia pedicellata*, *Cenanthe Phellandrium*, and species of *Potamogeton*.

THE first appendix to the *Kew Bulletin* for 1905, enumerating the hardy shrubs, trees, and herbaceous plants of which seed is available, has been received.

IN our issue of January 12 (p. 255) we referred to the prominent part taken by M. Leon Teisserenc de Bort in the establishment of a Scandinavian station for the exploration of the upper air by means of kites and unmanned balloons. The first results of this important enterprise have been published in a work entitled "*Travaux de la Station Franco-Scandinave de Sondages aériens à Hald, 1902-1903*," a large quarto volume of 160 pages. The station is situated on an extensive open domain belonging to M. Krabbe, near Viborg, in Jutland, and is due to the exertions of M.M. Hildebrandsson, Paulsen, and Mascart, the official meteorological representatives of Sweden (Upsala), Denmark, and France. The necessary subscriptions for carrying out the experiments have been chiefly contributed by private persons—in Sweden, by an anonymous donor, 28,000 francs; in Denmark, 245,000 francs (including a grant of 10,000 francs by the Danish Government); in France, 66,100 francs (of which M. Teisserenc de Bort contributed 50,000 francs, and a further loan of material from Trappes valued at about 12,000 francs). The Danish Government also lent two gunboats for kite experiments; the value of kite ascents from steamers at sea has been

more than ever fully established by the results obtained, some of the kites reaching altitudes varying from 3000 to 5900 metres. The difficulty of reaching such heights is well known to persons who have undertaken similar experiments.

PROF. DR. C. UHLIG contributes some notes of a journey from Kilimandjaro to Mweru to Nos. 9 and 10 of the *Zeitschrift* of the Berlin Gesellschaft für Erdkunde. The paper is illustrated by a number of excellent photographs.

THE last issue of the *Mitteilungen aus den deutschen Schutzgebieten* is entirely devoted to the region of the Pacific. Dr. Born records some observations on the ethnography of the Oleai Islands, Herr Senfft describes a visit to some of the West Caroline Islands, and there are abstracts of meteorological observations for 1903, and maps based on recent surveys.

THE last number of the *Deutsche geographische Blätter* contains reports of two lectures delivered to the Vereinigung für staatswissenschaftliche Fortbildung at its meeting at Bremen in November last. Dr. Tetens discussed the importance of Bremen as a centre of trade, and gave an exhaustive statistical account of its development and a comparison with other seaports; his paper is illustrated by nineteen sheets of diagrams, and should be of great value to students and teachers of commercial geography. Dr. W. Hochstetter lectured on the history of the North German Lloyd.

THE Royal Geographical Society has issued, as an extra publication, a paper on recent contributions to our knowledge of the floor of the North Atlantic Ocean, by Sir John Murray and Mr. R. E. Peake. The new material dealt with consists chiefly of soundings from the telegraph ships *Minia* and *Faraday*, but the chart accompanying the paper has been fully brought up to date, and new measurements of areas at different depths have been made. An interesting correspondence with the United States Hydrographic Office about the origin of the term "telegraphic plateau" appears in the introduction.

THE first place in the January number of the *Geographical Journal* is given to a striking address delivered to the International Congress of Arts and Sciences at St. Louis in September last by Dr. H. R. Mill. Dr. Mill's address is entitled "The Present Problems of Geography," by which the author means not "the whole penumbra of our ignorance, but those problems the solution of which at the present time is most urgent and appears most promising." Many of his conclusions concerning the scope and methods of geography are of profound significance. It seems specially appropriate that the address should immediately precede a paper on geography and education in the same number, in which the recent articles and correspondence in the newspapers are summarised and discussed. Dr. Mill puts his finger on many points which have formed real obstacles to the development of geographical teaching in schools and elsewhere.

A CORRESPONDENT of the *Physikalische Zeitschrift* inquires whether any experimental or other information exists regarding the heeling over of a ship on one side caused by the turning moment on the screw shaft.

PROF. R. W. WOOD describes in the *Physikalische Zeitschrift* a simple experiment for showing the pressure due to sound waves. The waves are made to converge to a focus by reflection, and close to this point is placed a

small horizontal paddle wheel almost exactly like a Crookes's radiometer. If the sound waves converge to one side of the wheel it will spin rapidly in the corresponding direction.

FROM the Volta Bureau of Washington we have received two reprints, one dealing with the so-called "visible speech" alphabet introduced into England by Dr. Alexander Melville Bell in 1865-7, and the other being an essay, by Dr. William Thornton, on teaching the deaf and dumb to speak, published in 1793. The reprints are illustrated by portraits of Drs. Bell and Thornton, and a biographical notice also accompanies Dr. Thornton's paper.

WE have received the report for 1903-4 of the *Scientific Society of St. Paul (Brazil)*, and have been able to gather from it that the society was founded in June, 1903, the city already having a historical and geographical, a medical and an agricultural society. It numbered in April last fifty-six effective, four contributing, one corresponding member, and two "socios ouvintes," a total of sixty-three members, of whom twenty-eight were foundation members. The membership list now, however, shows thirteen corresponding members. There have been held two preliminary, one inaugural, fourteen ordinary, and four "economic" meetings, and from the account of these meetings the papers seem to have been interesting and varied. A desirable improvement would be the publication of the reports in one of the international languages.

THE question as to whether the trioxide of nitrogen, N_2O_3 , is capable of existence has frequently been discussed, but until recently has remained unanswered owing to the lack of experimental data. When the brown gas produced by the action of starch or of arsenious anhydride on nitric acid is passed through a freezing mixture, it condenses to a blue liquid, which does not solidify at -90° . But the determination of its vapour-density shows that the gas is completely dissociated, and Ramsay and Cundall showed in 1885 that no contraction takes place when the monoxide and dioxide are mixed. The blue solution might therefore be regarded merely as a solution of NO in N_2O_4 . The actual existence of the trioxide has recently been demonstrated by Wittorff (*Zeit. anorg. Chem.*, vii., 209), who has investigated the freezing point of mixtures of different composition. A liquid having the empirical composition N_2O_3 solidifies to a blue crystalline solid, which melts at -103° C., and is undoubtedly the pure trioxide. As the proportion of N_2O_4 is increased the freezing point at first falls to a eutectic temperature at -112° C., and then rises to the freezing point of the peroxide. In this way, by accurate work at low temperatures, it has been possible to solve one of the long-debated problems of inorganic chemistry.

It has long been suspected that in solution the dichromates might perhaps be dissociated into neutral chromates and free chromic acid, thus,



Purely chemical methods have given but little information as to the nature of the dissolved salt. As the result of an ingenious application of physicochemical methods, the problem has recently been solved by Abegg and Cox, and these authors have been able actually to determine the proportion of free chromic acid in dichromate solutions of different concentrations. The method, which is described in the *Zeitschrift für physikalische Chemie* (vol. xlviii. p. 725), depends on saturating a solution of a dichromate with neutral and basic mercuric chromates, $HgCrO_4$ and

$HgCrO_4 \cdot HgO$. In presence of these two salts the concentration of free chromic acid in the solution is maintained constant at 0.706 mol. per litre at 50° and 0.456 mol. at 25° , and any excess of chromic acid must be combined either as chromate or as dichromate. It is calculated that in the case of potassium dichromate complete dissociation occurs at a dilution of 1000 litres, whilst at 100 litres 99 per cent. of the salt is dissociated, at 10 litres 91 per cent., and at a dilution of 1 litre 62 per cent. Even in the strongest solutions, therefore, the greater part of the dichromate is dissociated into chromic acid and normal chromate.

MESSRS. WHITTAKER AND Co. will shortly publish a new book entitled "The Insulation of Electric Machines," by Mr. H. W. Turner and Mr. H. M. Hobart.

MESSRS. GEORGE BELL AND SONS have published parts i. and ii. of "Elementary Algebra," by Messrs. W. M. Baker and A. A. Bourne, in one volume at 4s. 6d. The book may be had with or without answers.

THE twenty-fourth volume of the *Geographical Journal* has now been published. It contains the monthly numbers from July to December, 1904. As usual, the volume is richly illustrated by means of blocks and a profusion of well executed maps. The volume should be added to the library of every geographer and teacher of geography.

MESSRS. NEWTON AND Co.'s new supplementary list of lantern slides includes several sets which should prove very valuable to science teachers and lecturers. Among these instructive slides we notice photographs by Mr. W. M. Martin illustrating the embryology of a chicken; British birds and nests photographed by Mr. R. B. Lodge; photographs of insects and other small forms of animal life; photomicrographs of rock sections; and photographs of diseases of the bone, by Dr. C. T. Holland.

A REVISED and enlarged edition of Dr. Arthur Keith's "Human Embryology and Morphology" has been published by Mr. Edward Arnold. This edition differs from the last in several particulars. The chapters dealing with the early development of the human embryo and the formation of the placenta and membranes have been re-written. Much of the chapter dealing with the urogenital system has been amended, and numerous additions have been made in other sections of the book.

OUR ASTRONOMICAL COLUMN.

OBSERVATIONS OF COMETS 1904 *d* AND 1904 *e*.—The results of several observations of comets 1904 *d* and 1904 *e*, respectively, are published in a supplement to the *Astronomische Nachrichten*, No. 3987.

The latter object was observed at Bamberg by Prof. Hartwig on January 1 and 2, and was seen as a circular patch about 2' in diameter, having a nucleus which was not symmetrical. The magnitude of this comet has been variously estimated. In the above observation Prof. Hartwig recorded it as 11.0, but Prof. Nijland, observing at Utrecht on January 1, estimated it as 9.5, whilst Prof. Ambronn, observing at Göttingen on January 2, found it to be 10. The brightness at the time of discovery, as given by M. Borrelly, was equal to the tenth magnitude.

The following is an extract from the daily ephemeris of comet 1904 *d* published by Herr M. Ebell:—

12h. (M.T. Berlin).												
1905	α (true)			δ (true)			$\log r$	$\log \Delta$	Bright- ness			
	h.	m.	s.		h.	m.	s.					
Jan. 20 ...	17	57	38	...	+44	57	...	0.3253	...	0.3437	...	0.98
„ 24 ...	18	13	1	...	+47	5	...	0.3299	...	0.3446	...	0.95
„ 28 ...	18	29	11	...	+49	10	...	0.3346	...	0.3465	...	0.93
Feb. 1 ...	18	46	10	...	+51	9	...	0.3394	...	0.3495	...	0.89
„ 5 ...	19	3	58	...	+53	3	...	0.3443	...	0.3535	...	0.86
Brightness at time of discovery = 15.												

Brightness at time of discovery = 1.